

IN THE CLAIMS:

Please AMEND claims 1, 9, 47, 54 and 61, and ADD new claims 67-78, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Currently Amended) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element;

a second supporting member arranged in an outer diameter side of the first supporting member for supporting the first supporting member; and

at least one elastic member placed between the first supporting member and the second supporting member in a radial direction of the optical element, ~~said at least one elastic member being connected to said first supporting member and said second supporting member;~~ and said at least one elastic member being elastically deformable in the radial direction, wherein the value of the thermal expansion coefficient of said first supporting member is between those of the optical element and said second supporting member.

2. (Cancelled).

3. (Original) A structure according to Claim 1, wherein the thermal expansion coefficient difference between the optical element and the first supporting member is smaller than the thermal expansion coefficient difference between the optical element and the second supporting member.

4. (Original) A structure according to Claim 3, wherein the optical element is made from quartz and the first supporting member is made from an alloy including nickel.

5. (Original) A structure according to Claim 3, wherein the optical element is made from quartz and the first supporting member is made from one of a cordierite ceramic material including magnesium oxide and silicon oxide, a ceramic material including alumina and silicon nitride, and Zerojule (TM) which is glass with low thermal expansion.

6. (Original) A structure according to Claim 3, wherein the optical element is made from fluorite and the first supporting member is made from an alloy including copper.

7. (Previously Presented) A structure according to Claim 3, wherein the optical element is made from fluorite and the first supporting member is made from one of an alloy of iron-chromium-nickel and an alloy including aluminum as a principal ingredient.

8. (Original) A structure according to Claim 1, wherein the values of the thermal expansion coefficient of the optical element, the first supporting member, and the second supporting member are substantially the same.

9. (Currently Amended) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element;

a second supporting member arranged in an outer diameter side of the first supporting member for supporting the first supporting member; and

an elastic member placed between the first supporting member and the second supporting member in the radial direction of the optical element, an inner diameter side of the elastic member being connected contacted to the first supporting member while an outer diameter side of the elastic member being connected contacted to the second supporting member, the elastic member being elastically deformable in the radial direction,

wherein the elastic member is a plate-shaped spring member in which both ends thereof are connected to the first supporting member and the central portion thereof is connected to the second supporting member, and wherein a plurality of the plate-shaped spring members are arranged in a peripheral portion of the first supporting member at substantially equal intervals.

10. (Currently Amended) A structure according to Claim 1, wherein the elastic member is made from the same material as that of the first supporting member.

11. (Currently Amended) A structure according to Claim 1, wherein the optical element is one of a lens, a mirror, and an optical element to which diffraction is applied.

12. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer, wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 1.

13. (Previously Presented) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 12.

14 - 24. (Cancelled)

25. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle onto a wafer,

wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 9.

26. (Previously Presented) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 25.

27 - 33. (Cancelled)

34. (Previously Presented) A supporting structure for supporting a plurality of optical elements, said supporting structure comprising:

a plurality of first supporting members for respectively supporting the plurality of optical elements; and

a plurality of second supporting members for respectively supporting the plurality of first supporting members via a plurality of elastic structures having elasticity in the radial direction of the optical element,

wherein the radial clearance between one of the optical elements and a corresponding one of said the first supporting members contains adhesive.

35. (Original) A structure according to Claim 34, wherein the plurality of first supporting members do not contact each other.

36. (Cancelled)

37. (Cancelled)

38. (Original) A structure according to Claim 34, wherein the radial clearance between the optical element and the first supporting member is filled with adhesive along the whole circumference of the optical element.

39. (Original) A structure according to Claim 34, wherein the radial clearance between the optical element and the first supporting member is discontinuously filled with adhesive in a plurality of portions on the circumference of the optical element.

40. (Original) A structure according to Claim 34, wherein the thermal expansion coefficient of the first supporting member is an intermediate value between thermal expansion coefficient values of the optical element and the second supporting member.

41. (Cancelled)

42. (Previously Presented) A structure according to Claim 34, wherein the thermal expansion difference between the optical element and the first supporting member is less than the thermal expansion difference between the optical element and the second supporting member.

43 - 46. (Cancelled)

47. (Currently Amended) A supporting structure for supporting ~~an optical element~~ ~~a~~ plurality of optical elements, said supporting structure comprising:

~~a plurality of optical elements;~~

a plurality of first supporting members for respectively supporting the plurality of optical elements; and

a plurality of second supporting members for respectively supporting the plurality of first supporting members via structures having elasticity in the radial direction of the optical element,

wherein the elastic member is made from a plate-shaped spring member in which both ends of the spring member are ~~connected contacted~~ to the first supporting member and the central portion thereof is ~~connected contacted~~ to the second supporting member, and wherein a plurality of the plate-shaped spring members are arranged in the periphery of the first supporting member at substantially equal intervals.

48. (Cancelled)

49. (Original) A structure according to Claim 34, wherein the optical element is one of a lens, a mirror, and an optical element to which diffraction is applied.

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50. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer,
wherein at least one of the illuminating optical system and the projection optical
system have a supporting structure for supporting an optical element according to Claim 34.

51. (Previously Presented) A method for manufacturing semiconductor devices, said
method comprising:

performing an exposing step by an exposure apparatus according to Claim 50.

52. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer,
wherein at least one of the illuminating optical system and the projection optical
system have a supporting structure for supporting an optical element according to Claim 47.

53. (Previously Added) A method for manufacturing semiconductor devices, said method
comprising:

performing an exposing step by an exposure apparatus according to Claim 52.

54. (Currently Amended) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element;

a second supporting member arranged in an outer diameter side of the first supporting member for supporting the first supporting member, and via a plurality of elastic members placed between said first supporting member and said second supporting member in a radial direction of the optical element, said plurality of elastic members being connected to said first supporting member and said second supporting member, and each of said elastic members including, each of which respectively includes a spring member elastically deformable in the radial direction.

55. (Previously Presented) A structure according to claim 54, wherein the spring member has a plate-shaped spring member.

56. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer, wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 54.

57. (Previously Presented) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 56.

58. (Previously Presented) A supporting structure for supporting a plurality of optical elements, said supporting structure comprising:

a plurality of first supporting members each of which respectively supports each of the plurality of optical elements; and

a plurality of second supporting members each of which respectively supports each of the plurality of first supporting members via a plurality of spring members having elasticity in the radial direction of the optical element.

59. (Previously Presented) A structure according to claim 58, wherein the spring member has a plate-shaped spring member.

60. (Previously Presented) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer, wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 58.

61. (Currently Amended) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 56 58.

62. (Previously Presented) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element, wherein a radial clearance between the optical element and the first supporting member contains adhesive; and
a second supporting member for supporting the first supporting member via a plurality of elastic members having elasticity in a radial direction of the optical element.

63. (Previously Presented) A structure according to claim 62, wherein each of the elastic members has a spring member.

64. (Previously Presented) A structure according to claim 63, wherein each of the elastic members has a plate-shaped spring member.

65. (Previously Presented) An exposure apparatus comprising:
an illuminating optical system for illuminating a reticle with a light beam from a light source; and
a projection optical system for projecting a light beam from the reticle on a wafer,

wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 62.

66. (Previously Presented) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 65.

67. (New) A supporting structure for supporting an optical element, said supporting structure comprising:

a first supporting member for supporting the optical element; and

a second supporting member for supporting the first supporting member,

wherein the value of the thermal expansion coefficient of said first supporting member is between those of the optical element and said second supporting member.

68. (New) A structure according to Claim 67, wherein the thermal expansion difference between the optical element and the first supporting member is smaller than the thermal expansion difference between the optical element and the second supporting member.

69. (New) A structure according to Claim 67, wherein said first supporting member is supported by said second supporting member via plural elastic members.

70. (New) A structure according to Claim 69, wherein each of the elastic members has a plate-shaped spring member.

71. (New) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer,
wherein at least one of the illuminating optical system and the projection optical
system have a supporting structure for supporting an optical element according to Claim 67.

72. (New) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 71.

73. (New) A supporting structure for supporting an optical element, said supporting structure comprising:

a supported member including the optical element; and
a supporting member for supporting said supported member via a plurality of
elastic members having elasticity in a radial direction of the optical element.

74. (New) A structure according to Claim 73, wherein each of the elastic members has a spring member.

75. (New) A structure according to Claim 73, wherein each of the elastic members has a plate-shaped spring member.

76. (New) A structure according to Claim 73, wherein each of the elastic members is contacted with an outer surface of said supported member and an inner surface of said supporting member.

77. (New) An exposure apparatus comprising:

an illuminating optical system for illuminating a reticle with a light beam from a light source; and

a projection optical system for projecting a light beam from the reticle on a wafer, wherein at least one of the illuminating optical system and the projection optical system have a supporting structure for supporting an optical element according to Claim 73.

78. (New) A method for manufacturing semiconductor devices, said method comprising:

performing an exposing step by an exposure apparatus according to Claim 77.